

CLAIMS

1. A powder inhaler for administering powder by inhalation, comprising:
a flow path defined by a plurality of surfaces through which a stream of air is in use drawn
on inhalation by a user; and
dosing means (18) for providing a dose of powder to the flow path for entrainment in the
stream of air;
characterized in that the inhaler further comprises dislodging means for dislodging powder
accumulated on a surface of the flow path downstream of the dosing means (18).
2. The inhaler according to claim 1, wherein the flow path includes a chamber (58) having an
inlet and an outlet.
3. The inhaler according to claim 2, wherein the dislodging means is adapted to contact a
surface defining at least a part of the chamber (58).
4. The inhaler according to claim 2 or 3, wherein the dislodging means comprises a loose
element (64) disposed within the chamber (58) which is configured so as not to obstruct
the stream of air drawn through the chamber (58) during inhalation by the user.
5. The inhaler according to claim 4, wherein the loose element (64) comprises a ring.
6. The inhaler according to claim 4 or 5, wherein the loose element (64) is composed of a
metal.
7. The inhaler according to claim 2 or 3, wherein the dislodging means comprises a plurality
of flexible elements (62) disposed at the inlet to the chamber (58), the flexible elements
(62) being of such length and flexibility to contact a surface defining at least a part of the
chamber (58) during inhalation by the user.

8. The inhaler according to claim 2 or 3, wherein the inlet and the outlet to the chamber (58) are formed in opposed surfaces that are relatively rotatable in relation to one another and the dislodging means comprises a member (142; 156) which is fixed in relation to one of the opposed surfaces and is configured to contact the other of the opposed surfaces so as to dislodge powder accumulated on the other of the opposed surfaces on relative rotation of the opposed surfaces.
9. The inhaler according to claim 8, wherein the member (142; 156) comprises one of a scraper or a brush.
10. The inhaler according to claim 8 or 9, further comprising a storage chamber (28) for storing a plurality of doses of powder, the storage chamber (28) having a filling inlet in one of the opposed surfaces of the chamber (58), and a plug for sealing the filling inlet, wherein the member (142) is formed as a part of or attached to the plug.
11. The inhaler according to claim 1 or 2, wherein the dislodging means is adapted to create vibrations in the inhaler.
12. The inhaler according to claim 11, wherein the dislodging means comprises first and second relatively movable components (66, 68; 80, 82; 100, 102; 110, 112; 124, 126), each having cooperating surfaces (74, 78; 88, 94; 106, 108; 118, 122; 132) which are resiliently biased towards one another, at least one of the cooperating surfaces (74; 88; 106; 118; 132) having one or more discontinuities such that as the first and second components (66, 68; 80, 82; 100, 102; 110, 112; 124, 126) are moved relative to one another vibrations are created in the inhaler.
13. The inhaler according to claim 12, wherein the at least one of the cooperating surfaces (74; 88; 106; 132) has a saw-tooth cross-section.

14. The inhaler according to claim 12 or 13, wherein the other of the cooperating surfaces (94; 108; 122) is provided on a resiliently-biased arm.

15. The inhaler according to any of claims 12 to 14, wherein the first and second components (66, 68; 80, 82; 100, 102; 110, 112; 124, 126) are relatively rotatable.

16. The inhaler according to claim 15, wherein the at least one of the cooperating surfaces (74; 88; 106; 118; 132) generally defines a circle.

17. The inhaler according to claim 15 or 16, wherein the at least one of the cooperating surfaces (106; 118) is radially directed.

18. The inhaler according to claim 15 or 16, wherein the at least one of the cooperating surfaces (74; 88; 132) is axially directed.

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19. The inhaler according to any of claims 12 to 18, further comprising a mouthpiece (2) for gripping in the lips of the user and an inhaler body (6) for housing the dosing means (18), wherein at least a part of the mouthpiece (2) is rotatable relative to the inhaler body (6) and one or both of the mouthpiece (2) and the inhaler body (6) comprise or are attached to the first and second components (66, 68; 80, 82; 100, 102; 110, 112; 124, 126).

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20. The inhaler according to any of claims 12 to 18, comprising a main body having an outlet nozzle (4) and a cap (168) for fitting to the main body when the inhaler is not in use, wherein the cap (168) and the main body comprise or are attached to the first and second components (66, 68; 80, 82; 100, 102; 110, 112; 124, 126).

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21. The inhaler according to any of claims 12 to 20 when appendant upon claim 2, wherein at least a part of the surface of the chamber (58) is flexible, which at least part of the surface of the chamber (58) is connected to one of the cooperating surfaces (132) and is flexed on relative rotation of the first and second components (124, 126).

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22. The inhaler according to claim 21, wherein the at least part of the surface of the chamber (58) is defined by one of the first and second components (124).

5 23. The inhaler according to claim 21 or 22, wherein the at least part of the surface of the chamber (58) is the surface of the chamber (58) opposed to the inlet thereto.

24. The inhaler according to claim 1 or 2, comprising a main body having an outlet nozzle (4) and a cap (168) for fitting to the main body when the inhaler is not in use, wherein the
10 dislodging means comprises a brush (178) which is attached to the cap (168) for insertion into the outlet nozzle (4) when the cap (168) is fitted to the main body.

25. A powder inhaler for administering powder by inhalation, comprising:

a housing having a screw thread;

15 a mouthpiece (2) attached to the housing so as to be rotatable relative thereto; and

a cap (168) for covering at least the mouthpiece (2), the cap (168) having a screw thread for engaging the screw thread on the housing;

characterized in that the mouthpiece (2) and the cap (168) are adapted such that at least a part of the mouthpiece (2) is rotated relative to the housing on one of screwing or
20 unscrewing the cap (168), which part of the mouthpiece (2) remains substantially in fixed position relative to the housing on the other of screwing or unscrewing the cap (168).

26. The inhaler according to claim 25, wherein the mouthpiece (2) and the cap (168) each comprise parts which engage on the one of screwing or unscrewing the cap (168) so as to
25 rotate the at least part of the mouthpiece (2).

27. The inhaler according to claim 26, wherein the engaging parts comprise at least one resiliently-biased member (170; 176) and at least one projection (164) or recess (172), the at least one resiliently-biased member (170; 176) being configured to engage the at least
30 one projection (164) or recess (172) on the one of screwing or unscrewing the cap (168).

28. The inhaler according to any of claims 25 to 27, wherein the at least part of the mouthpiece (2) is rotated relative to the housing on unscrewing the cap (168).

5 29. The inhaler according to any of claims 25 to 28, wherein the housing comprises a rotatable grip portion (8) which in use is rotated to provide a dose of powder for inhalation, the grip portion (8) being rotated to provide a dose of powder for inhalation in the same sense as that in which the cap (168) is rotated to rotate the at least part of the mouthpiece (2).

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30. The inhaler according to any of claims 25 to 29, further comprising means for providing resistance to relative rotation of the at least part of the mouthpiece (2) and the housing.

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31. The inhaler according to claim 30, wherein the rotation resistance means allows rotation of the mouthpiece (2) relative to the housing on the other of screwing or unscrewing the cap (168) only for forces greater than that required to rotate the cap (168) on the one of screwing or unscrewing the cap (168).

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32. The inhaler according to claim 30 or 31, wherein the rotation resistance means comprises a ratchet mechanism.

33. The inhaler according to claim 31 or 32, wherein the inhaler is configured such that rotation of the at least part of the mouthpiece (2) relative to the housing on the other of screwing or unscrewing the cap (168) causes no damage thereto.